

COVID-19 information disorder

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COVID-19 information disorder: six types of harmful information during the pandemic in Europe

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ABSTRACT

The outbreak of a novel coronavirus disease COVID-19 propelled the creation, transmission, and consumption of false information – unverified claims, misleading statements, false rumours, conspiracy theories, and so on – all around the world. When various official or unofficial sources issue erroneous, misleading or contradicting information during a crisis, people who are exposed to this may behave in ways that cause harm to the health and well-being of themselves or others, e.g., by not taking appropriate risk reducing measures or blaming or harassing vulnerable groups.

To work towards a typology of informational content that may increase people's vulnerability in the context of the coronavirus pandemic, we explored 98 instances of potentially harmful information that spread in six European countries – France, Italy, Norway, Finland, Lithuania, and Estonia – between March and May 2020.

We suggest that during the pandemic, exposure to harmful information may have made people more vulnerable in six ways: (1) by discouraging appropriate protective actions against catching/spreading the virus, (2) by promoting the use of false (or harmful) remedies against the virus, (3) by misrepresenting the transmission mechanisms of the virus, (4) by downplaying the risks related to the pandemic, (5) by tricking people into buying fake protection against the virus or into revealing their confidential information, and (6) by victimising the alleged spreaders of the virus by harassment/hate speech. The proposed typology can be used to guide the development of risk communication plans to address each of these information-related vulnerabilities.

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1. Introduction: Information disorder and pandemic vulnerability

The outbreak of a novel coronavirus disease COVID-19 in 2020 propelled the creation, transmission, and consumption of false information – unverified claims, misleading statements, false rumours, conspiracy theories, and so on – all around the world. Researchers have started

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to chart the spread of false information (Brennen, Simon, Howard, and Nielsen, 2020) as well as the related risks (Krause et al., 2020; Aven and Boudier, 2020).

The terms ‘misinfodemics’ and ‘infodemic’ have been proposed to refer to the processes whereby misinformation may fuel the spread of diseases (Gyenes and Mina, 2018; Zarocostas, 2020). People may lack the necessary health literacy – the ability to acquire, understand, and use health-related information – to recognise false information concerning the pandemic, adopt appropriate precautions and protective behaviour, and thereby avoid unnecessary risks for infection with or spread of the virus (Paakkari and Okan, 2020).

A joint report by fact-checking organisations in France, Germany, Italy, Spain, and the UK on the false information that they had debunked in these countries over the months of March and April 2020 indicates that some of the most common themes of these were misleading medical advice around supposed cures or remedies for COVID-19, political hoaxes, and various conspiracy theories – for instance, claims that the virus was man-made and that COVID-19 was caused or spread by 5 G cellphone technology (AFP, CORRECTIV, Pagella Politica/Facta, Maldita.es, and Full Fact, 2020). An analysis by the Reuters Institute for the Study of Journalism of 225 pieces of false information about the new coronavirus between January and March 2020 identified nine types of false claims, among which the most common were those about the actions or policies of public authorities, such as WHO and UN (Brennen, Simon, Howard, and Nielsen, 2020).

These studies point to the pandemic-specific symptoms of ‘information disorder’ (Wardle and Derakhshan, 2018) – the growing global information pollution that involves many guises of false and potentially harmful information. False and/or harmful information may spread via various channels and take various forms, for example, journalistic stories in newspapers or on TV, social media postings (e.g., messages, images or videos on Facebook, YouTube, Twitter), rumours, pranks, and outdated information. These range from satire and misleading content (*misinformation*, which may be shared without intending harm) to manipulated or fabricated content (*disinformation*, which may be shared with destructive intent). Importantly, people’s vulnerability may also be triggered by *malinformation* – the deliberate publication of genuine information that is used to inflict harm, for example, when an information leak encourages ill-advised protective behaviour, results in hate speech/harassment targeted against some disadvantaged groups or individuals, or invades someone’s privacy.

While the studies referred to above have often focused on the falseness dimension of the coronavirus-related information disorder, in this article we make a contribution to a better understanding of its harm dimension. We seek to describe the types of pandemic-related informational content exposure to which could potentially make people more vulnerable, that is, increase their proneness to experience adverse effects, such as harm to the health and well-being of themselves or others.

2. Methodological considerations: focusing on potential harm

In the context of a crisis such as the coronavirus pandemic, people may become vulnerable due to the spreading of false or harmful information when they (1) believe in false information about hazards or crises and therefore act in ways that put themselves or others at risk; (2) receive too much or conflicting information and hence are not able to decide what is important, or what is accurate or not, and are therefore more likely to fall victim of pranks and scams; (3) regard correct information about hazards as false (e.g., because they believe the sender is not trustworthy) and therefore act in ways that put themselves or others at risk; (4) suffer from hate speech, harassment, or leaks/violation of privacy (Hansson et al., 2020). Therefore, in this study we are interested in all kinds of messages that could potentially produce adverse effects to people’s health or well-being, no matter what the possible motivations of the creators/disseminators of these

messages may be (i.e., whether or not the information is being used strategically by some agent for financial gain or to harm someone).

We compiled a set of 98 small case studies based on news media stories, scientific and official reports, and other relevant documents that dealt with various forms of false and/or harmful information and their effects during the first three months of the COVID-19 pandemic (between 1 March and 30 May 2020) in six European countries: France, Italy, Norway, Finland, Lithuania, and Estonia. The selection of countries was driven by our language competences and access to data. It should be noted that this is an exploratory qualitative study that is not meant to lend itself to generalisations or comparisons about the prevalence of particular harmful messages within or across countries. The reason for drawing upon cases from several countries was that this allowed us to grasp the diversity of types of harmful information present both in larger and smaller European countries with varied experiences of coping with the pandemic. We searched for publicly disseminated claims about COVID-19 that included erroneous or misleading and (potentially) harmful assertions regarding remedies, diagnostics, means of stopping virus transmission, cleaning, use of protective gear, and preparedness. We also mapped instances of pandemic-related scams, hate speech, harassment, and deliberate information leaks that have inflicted harm to people.

As our focus is on people's vulnerability, we did *not* include in our data any claims that were unlikely to encourage potentially harmful behaviour or make people more likely to face hazards in some other way. For instance, we did not study conspiracy theories about the origins of the novel coronavirus or the transmission of the virus via 5 G networks, unfounded criticisms of government mismanagement, or any hoaxes promoted by political actors primarily for political gain.

Admittedly, potentially harmful information was (and in some cases, still is) difficult to fact-check or debunk because of the novel nature of COVID-19, the lack of scientific evidence, and the frequently updated official recommendations and regulations. The high uncertainty surrounding pandemics pose a challenge to risk communicators (Glik, 2007; Bostrom et al., 2020; Krause et al., 2020). It is a 'creeping crisis' (Boin, Ekengren, and Rhinard, 2020) where a threat to life-sustaining systems evolves over time and space, making it hard to trace and respond to both for governments and scholars. Policy responses to the pandemic have differed from country to country (Capano, Howlett, Jarvis, Ramesh, and Goyal, 2020). In our study, we relied on the World Health Organisation (WHO, n/d), national public health authorities, and country-specific fact-checking organisations (such as faktisk.no in Norway and lemonde.fr/les-decodeurs in France) for verification of information regarding the pandemic.

Before we present our typology, one more important caveat: It is not our aim in this article to measure how susceptible people in different national contexts might be to false/harmful information. There is some previous work on macro-level factors that might explain why some countries are more resilient to false information about politics (see, e.g., Humprecht, Esser, and Van Aelst, 2020). The effects of news and social media on peoples' understanding of rare virus outbreaks deserve further research: these range from underreaction to inducing panic (Fu and Zhu, 2020; Björkdahl and Carlsen, 2017; Klemm, Das, and Hartmann, 2016; Kilgo, Yoo, and Johnson, 2019). While audiences across the world were exposed to false claims about COVID-19 during the first three months of the pandemic, surveys indicated that many people recognised or ignored these (Ofcom, 2020; Cushion, Kyriakidou, Morani, and Soo, 2020; Nielsen, Fletcher, Newman, Brennen, and Howard, 2020).

Press has reported instances where people have died or suffered due to believing falsehoods about COVID-19 'cures' and ingesting household disinfectants, chloroquine phosphate, or methanol (e.g., Slotkin, 2020; Associated Press, 2020; Forrest, 2020). While we admit that many people may disregard false and harmful pandemic-related claims and adopt appropriate precautions, in this study we deliberately think in terms of 'worst case scenarios' to draw attention to possible risks and vulnerabilities: what kind of harm could occur if people believed in and acted upon

particular kinds of false/harmful informational content that they were exposed to during the onset of the pandemic.

3. Results: types of harmful information during the COVID-19 pandemic

We found six types of potentially harmful information that emerged during the first three months of the COVID-19 pandemic.

1. Messages that depicted recommended or obligatory protective measures (e.g., wearing a mask, using a hand sanitiser, observing lockdown) as either harmful or unnecessary. This was often done by appealing to fear and casting doubt on official requirements/advice.
2. Messages promoting the use of false (or harmful) remedies against the virus – essentially giving scientifically unfounded medical advice.
3. Misrepresentations of the transmission mechanisms of the coronavirus that could have made some people falsely believe that they were either immune to or unlikely to catch the coronavirus due to some personal factor such as their blood group, or practices such as smoking, healthy eating, or drinking hot beverages.
4. Messages that suggested that COVID-19 did not exist or was not severe, that the overall risk of catching it was low, and that the pandemic would end shortly, thereby potentially lowering the perceptions of health risk and discouraging cautious behaviour.
5. Scammers exploited the uncertainty created by the pandemic to trick people into buying fake protection against the virus or into revealing their confidential information.
6. Certain individuals and groups were subjected to harassment/hate speech as the alleged spreaders of the virus.

We will discuss and exemplify these in turn.

3.1. Type 1: discouraging appropriate protective actions against catching/spreading the virus

As there were no vaccines against COVID-19 yet at the time, various pandemic containment measures were introduced in many countries: travel restrictions, distancing (limiting close contact with others outside one's household), wearing of protective masks, use of hand sanitiser, testing and tracking to identify and isolate infected individuals, etc. (Capano et al., 2020; Douglas, Katikireddi, Taulbut, McKee, and McCartney, 2020). In that context, the spreading of messages that actively advised or warned people against following official pandemic recommendations and taking up precautionary behaviour could be qualified as harmful. The following six case descriptions help to illustrate this.

- *PROTECTIVE FACE MASKS CLAIMED TO POSE A HEALTH RISK.* On 13 May 2020, an Italian blog called "Mondo Sporco" posted a picture of a protective face mask with the text "The mask seriously damages your health" accompanied by a story claiming that wearing a mask obstructs breathing, prevents the right amount of oxygen from entering the lungs, creates toxins inside the body, and causes a risk of a severe lung disease. The blog that had more than 22,000 followers on Facebook and was widely shared via social media claimed that people who use a mask would get sick with the 'mask syndrome' and then certified as being victims of COVID-19. The post referenced Dr. Stefano Montanari, who claimed that masks "are good for stopping turkeys, but not viruses that measure 120 nanometers", and recommended that these masks must not be worn unless a person is really sick (Mondo Sporco, 2020). Similar stories also appeared in other social media profiles, with one claiming that someone had inserted the COVID-19 virus

into the masks so that people who wear those would get infected. The spreading of these falsehoods may have encouraged some people to disregard the official prevention and containment measures that included the mandatory use of a protective mask in all public spaces and whenever it was not possible to respect social distancing.

- *WEARING A PROTECTIVE MASK DESCRIBED AS UNNECESSARY.* On 4 May 2020 in Lithuania, a video was posted on Facebook (and thereafter shared more than a thousand times) where a man checks the official webpage of the Centre for Communicable Diseases and AIDS, finds a section dedicated to COVID-19, and points at an infographic which, in addition to detailed explanation of how to wash hands, explicitly advised not to wear a protective mask unless one experienced symptoms of the disease (Užkuraitis, 2020). However, this infographic was actually outdated: it had been posted on 27 February when the global pandemic was still on the way and an official recommendation had not been issued yet on wearing a mask even without any symptoms of COVID-19. The Centre had deleted the outdated infographic from its website on the same day when the Facebook video was uploaded. In a similar vein, another Facebook video uploaded on 3 May 2020 (and thereafter shared more than 2000 times) showed an excerpt from an official speech by the Minister of Health Aurelijus Veryga where he claimed that there was no need to buy face masks (Petkauskas, 2020). However, the speech was originally recorded on 2 March and at that time the requirement to wear a mask outdoors was not yet in place. Moreover, the quote in the video was taken out of context: the minister was discussing panic buying of masks and asked people to approach this purchase reasonably. Both instances involved the resurfacing of outdated (and hence misleading) advice via Facebook videos that could discourage people from taking appropriate protective action.
- *LUNG VENTILATION DESCRIBED AS A DANGEROUS PRACTICE.* In early April 2020, some Lithuanian news websites shared an article titled “How to reach the death rate indicators when the virus is not harmful? Anticipate an algorithm for treatment – mandatory lung ventilation” (Merkytė, 2020). The article falsely claimed that lung ventilation is a very harmful practice which can make patient disabled for the rest of life, and listed potential complications such as tears of lungs, chronic inflammation of trachea and lungs, and metabolic process disorders. A detailed list of medical claims, presented in a professional-sounding language, could give an impression of a credible content, thereby potentially discouraging people from seeking professional medical assistance when experiencing any symptoms of the virus.
- *COVID-19 TESTS AND VACCINATION DESCRIBED AS RISKY.* On 3 April 2020, an Italian youth-oriented current affairs and science website Essere Informati (2020) published an article claiming that COVID-19 test kits are infected by the virus. The article referred to the British newspaper *The Telegraph* that reported a few days earlier that test kits intended for the UK were contaminated with coronavirus. Essere Informati that has more than 16,000 followers on Facebook, suggested that the contaminated kits may have been produced in Italy, thereby giving an impression that testing for coronavirus in Italy might be hazardous. In a similar vein, a news website called News NT (2020) published an article falsely claiming that the first person to participate in the Oxford University trial testing a new coronavirus vaccine had died two days after being injected with a vaccine. Both misleading stories that were widely shared on social media, essentially discourage people from participating in institutional solutions to block the spreading of a disease – testing and vaccinating – by associating these measures with increased health risk. Aversion to participate in vaccination is of course not specific to the COVID-19 pandemic: vaccine fears and the anti-vaccination activism emerged already in the 19th century in response to official smallpox vaccination programmes (Durbach, 2004) and have more recently spread widely on social media (Kata, 2010, 2012).
- *PEOPLE ADVISED NOT TO SEEK MEDICAL ASSISTANCE.* In France, several tweets and Facebook posts were sent from fake accounts pretending to be French medical staff supposedly working in emergency departments of different hospitals warning that their units were overloaded and claimed there was no use turning in as no more patients could be treated. Hospitals

mentioned in these messages varied: those of Lille, Brest, Toulouse, and Nantes appeared. Later, all those hospitals officially denied these claims (Pernin, 2020). This type of fake messages seems particularly harmful as it could prevent people from going to an emergency when they have coronavirus symptoms or other serious health problems. Reportedly, many French citizens had stopped seeing doctors as the pandemic spread due to fear of catching the virus (Paugam, 2020). Such false advice is likely to strengthen this phenomenon and, in worse cases, lead to deaths of patients who could have been otherwise saved.

- **FAKE LOCKDOWN LIFTING MAP.** A fake ‘official’ map was first published on social networks in France (e.g., on 6 April 2020 on Twitter), then shown on a popular TV show “*Touche pas à mon poste*”. On this map, France was divided into three zones and the dates when lockdown was supposed to end were indicated for each zone. The map contained several official logos to make it look authentic. Shortly after its publication the authorities denied the authenticity of this map (Le Monde, 7 April 2020). However, hundreds of thousands of people had seen it by that time and probably much fewer might have read the official denial. Official maps appeared weeks later and contained different information. Meantime, people who saw and believed the fake maps might have been encouraged to violate the restrictions imposed by lockdown, thereby putting their health as well as others’ at risk.

3.2. Type 2: promoting the use of false (or harmful) remedies against the virus

When novel outbreaks occur, some people may engage in offering health advice that is not based on biomedical science. This behaviour may be seen as falling under the broader phenomenon of ‘alternative medicine’ – the use of untested and unregulated remedies (Angell and Kassirer, 1998). Even governments may sometimes engage in ‘magical thinking’ and push unproven pharmaceutical solutions to a health crisis (Atkinson, McCue, Prier, and Atkinson, 2020). In the countries included in our study, this type of harmful messages contained, among others, false claims that the novel coronavirus could be treated by consuming vitamin C, tea, water, herbal infusions, sodium bicarbonate, probiotics, or a gargle made of vinegar and salt, by breathing hot air, smoking, and going to sauna. Below, we provide two case descriptions to exemplify this type of harmful information in context.

- **ROQUEFORT CHEESE PROMOTED AS A REMEDY.** On 18 April 2020, a message was published and shared thousands of times on Facebook in France claiming that eating famous French Roquefort cheese is a good remedy against COVID-19. The message was presented as an extract from a scientific article explaining that *Penicillium roqueforti*, a fungus used to produce Roquefort, was also used by French infectologist Didier Raoult to create chloroquine, a medication tested by him to treat COVID-19, and that this species of fungus reinforces human body’s immunity and therefore acts as a ‘barrier’ to coronavirus infection (Le Monde, 2020). This information was later refuted by scientists from the French National Scientific Research Centre (CNRS) and professor Raoult did not confirm this either. Two days later, the author of the Facebook post admitted that it had been a joke intended to promote the cheese. Nevertheless, even if the intention was supposedly satirical, it could have negative effects on those who shared it. Just like any other false remedy, it may create a false sense of security and undermine the application of proven protection measures such as washing hands, observing lockdown, or wearing a mask.
- **COLLOIDAL SILVER ADVERTISED AS A REMEDY.** On 16 March 2020, an Estonian Facebook page titled “Health with Natural Products – Coral Club” (2020) started advertising a colloidal silver product called Silver-Max Care, stating that it “significantly reduces the risk of infection and delivers positive results in the following cases...” and listing “infectious respiratory diseases” among them. Actually, there is no evidence that colloidal silver (a colloid consisting of silver

particles suspended in liquid) treats or prevents any medical condition and selling this product as pharmaceutical drug is prohibited in Estonia. In the context of a pandemic, misleading promotion of this product could lead to overdoses by anxious people, misuse of the product, or a sense of false security among users.

3.3. Type 3: misrepresenting the transmission mechanisms of and immunity to the virus

Some studies suggest that when people are more knowledgeable about how a virus is transmitted, they are more likely to adopt precautionary behaviours and comply with official restrictions (Leung et al., 2004; Eastwood et al., 2009). Therefore, if people believe in misrepresentations of the transmission mechanisms of the coronavirus, they could falsely think that they are either immune to or unlikely to get infected due to some personal health characteristic or behaviour.

When some group is depicted in media as more vulnerable to a health risk, people belonging to other groups may think they are 'safe' and disregard official recommendations for risk reduction (Salmon, Byrne, and Fernandez, 2014). Those portrayed as members of more vulnerable groups may suffer from higher levels of anxiety that may in turn lead to negative health outcomes (Balog-Way and McComas, 2020). In the countries included in our study, this type of harmful messages contained, among others, false claims that the novel coronavirus is spread by bacteria, and that it can be kept away by high temperature, sunlight, smoking, healthy eating, and meditation. Here is a case description to exemplify this type of harmful information in context.

- *PEOPLE WITH BLOOD GROUP O CLAIMED TO BE LESS SUSCEPTIBLE TO COVID-19.* On 18 March 2020, an Estonian regional news portal Lõunaestlane.ee (2020a) published a story titled "New study: People with blood group A more susceptible to coronavirus" and mentioned that A is the most common blood group among Estonian population. The story was shared by several 'alternative news' sites in Estonia. The story referred to an article in *South China Morning Post* that cited a Chinese study claiming those with blood group O 'had a significantly lower risk for the infectious disease' compared to others. Sharing such officially uncorroborated news may create unfounded anxiety among Estonian readers and might lead to a false sense of security among people with blood group O. This type of potentially harmful information is difficult to fact-check or debunk because of the novel nature of COVID-19 and the lack of scientific evidence.

3.4. Type 4: downplaying the risks related to the pandemic

Previous research indicates that people's higher risk perceptions for oneself regarding susceptibility to a pandemic, as well as the greater perceived severity of the disease, tend to increase the likelihood of associated preventive or avoidance behaviours (Bish and Michie, 2010; Rudisill, 2013; Toohar et al., 2013; Dryhurst et al., 2020). Believing that the pandemic would continue for a long time also encourages people to carry out recommended protective behaviours (Rubin, Amlôt, Page, and Wessely, 2009). Accordingly, misguided public depictions of the pandemic that downplay its severity or infectiousness, or even question its existence, may discourage people from adopting appropriate precautions (Ash et al., 2020). People may underreact by deliberately engaging in risky behaviour and inadvertently spreading the virus. Below, we provide three case descriptions to exemplify this type of harmful information.

- *CORONAVIRUS EPIDEMIC PREDICTED TO END ON 9TH AUGUST IN FRANCE.* On 29 April 2020, a French-speaking Israeli news site infos-israel.news published extracts from an article which then went viral on Facebook (Sibille, 2020). The extract presented predictions according to which the coronavirus epidemic would end on 9 July in Israel and on 9 August in France. The article had been originally issued by a Singapore University of Technology and Design and contained

hypothetical calculations based on mathematical modelling. As the authors of the article explained, the predictions were built as of 28th April and could evolve depending on the situation in each country studied. They also warned against any imprudent interpretation of these predictions. However, online reactions to this post indicate that, although factually accurate, such stories can be easily misinterpreted, provoking unfounded feelings of optimism and certainty as to the ending of the epidemic. Eventually, it also can make people who read the news behave unsafely.

- *CORONAVIRUS EPIDEMIC PREDICTED TO END IN 2-3 WEEKS.* On 26 March 2020, an Estonian regional news portal Lõunaestlane.ee (2020b) published a story titled 'Will the corona epidemic really be over in 2-3 weeks? A British scientist thinks so'. The article claimed that Neil Ferguson, a leading British epidemiologist, had estimated that the epidemic 'will last for 2 or 3 weeks'. The article suggested that Ferguson's estimation had been published in the international science periodical New Scientist. However, the referenced story in New Scientist actually said something very different: that Ferguson was 'reasonably confident' that the health service in the UK could cope with the spread of the COVID-19 virus when the predicted peak of the epidemic arrived in two or three weeks. By misrepresenting the words of a prominent epidemiologist and misquoting a well-known science magazine, the Estonian news portal downplayed the continued health threat posed by the pandemic, possibly creating a false sense of security among its readers. If people falsely believe that the epidemic will end shortly, they may disregard health and safety advice and behave in ways that put themselves or others at risk.
- *DENYING THE EXISTENCE OF THE VIRUS.* On 12 April 2020, a man claiming to be a veterinarian and having studied virology stated in a posting on Facebook in Estonia that viruses do not exist (<https://www.facebook.com/groups/282626385574048/permalink/857087321461282/>). He also claimed that 'viruses' are caused by microwaves and the 'coronavirus' pandemic started from cities that had '5G networks massively activated'. This posting was shared hundreds of times on social media. If readers falsely believe these claims, they may underestimate the risk of infection and endanger themselves and others around them.

3.5. Type 5: scams

Since the onset of the pandemic, a growing number of COVID-19-related cybercrime scam incidents have been reported (Naidoo, 2020). Various types of scams exploit people's fear of the virus and the general uncertainty surrounding the outbreak. Scammers typically want to sell some remedies or health-checks to people, trick people into revealing their confidential bank details, or steal their money and possessions if they are able to enter their homes on some coronavirus-related pretence. Scam victims risk losing their money or valuables, which could cause high levels of anxiety once they realise what happened. Scams may pose a direct threat to victims' physical health if the purchased remedies are ineffective or even harmful, or people may change their behaviour and expose themselves to risk when trusting a scammer. Moreover, the scammers who intrude victims' homes may also spread the virus.

In the countries included in our study, we found reports of scammers who, for instance, tried to sell fake coronavirus tests, offered 'bio-resonance devices' that would 'heal from COVID-19', promoted essential oils to be used as disinfectants, and visited people's homes to 'install coronavirus filters' but actually stole their valuables. The following two case descriptions exemplify this type of harmful behaviour in context.

- *'HIGH-TECH MASKS' PROMOTED.* An advertisement for the website norskemasker.com appeared in the Facebook feed of many Norwegians on 9 March 2020. The sponsored post advertised a 'high-tech mask' which was supposed to protect against the spread of coronavirus (Egeberg,

2020b). Later the same month, a new webpage promoted an 'electric respirator air mask' to Norwegian Facebook users (Egeberg, 2020a). Around the end of March, an image from the 'Masks Save Lives' website was spread among Norwegian Facebook users, claiming that COVID-19 mortality rates were higher in the countries with no tradition of wearing a mask compared to those where it is common (Skipham, 2020). It is not certain whether anybody actually received the so-called high-tech masks. However, people may have wasted money trying to buy these masks and falsely believed that they were completely protected against infection if they used such masks.

- *PENSIONERS TRICKED INTO REVEALING THEIR CONFIDENTIAL BANK DETAILS.* On 18 March 2020, the Estonian Police warned people via social media of a COVID-19-related scam: a man calling pensioners and telling them that because pension home delivery had been cancelled due to the COVID-19 situation, they should provide the caller with personal bank details to receive their pension. It is unclear whether anyone was really harmed due to this scam. Such phone scams exploit people's fears and confusion in the context of the pandemic, and could, in principle, make the elderly more vulnerable to identity theft and result in losing their life savings.

3.6. Type 6: harassment of the alleged spreaders of the virus

Crises, such as pandemics, often spark a search for culprits which may result in stigmatisation, harassment and hate speech directed at various (minority) groups and individuals in society (Muzzatti, 2005; Taylor, 2019). The COVID-19 pandemic is not an exception. For example, Asian people have fallen victim of racist hate speech because the novel coronavirus was first recorded in China (Lee, 2020; Gover, Harper, and Langton, 2020). Being subjected to verbal racially motivated attacks may have negative mental health consequences (Gee et al., 2007). In our data, there are cases of hostility towards groups with high infection rate. Here is one case description to exemplify this type of harmful behaviour.

- *INHABITANTS OF A REFUGEE CENTRE HARASSED.* On 30 April 2020, Finnish media reported that a refugee centre in Espoo, Finland, had been put to quarantine because of a high number of COVID-19 cases. Afterwards, some of the refugee centre inhabitants were seen outside of their building, visiting a nearby shop where they were encountered with hostile behaviour and were reported to the authorities. The next day, an article was published explaining that there were some people in the refugee centre – those who had recovered from the infection – who were actually free to move outside the refugee centre. The initially given information had led many to believe that all the inhabitants should have stayed in the whole time (Vasantola, 2020).

4. Discussion: addressing information-related pandemic vulnerability

The types of harmful information described above illuminate the intricate links between information disorder – various types of false and/or harmful information – and social vulnerability in the context of a health crisis. Theoretically, social vulnerability to crises may be triggered by (a combination of) three kinds of factors: situational, individual, and social-structural (Hilhorst and Bankoff, 2004; Kuran et al., 2020; Hansson et al., 2020). Accordingly, information-related pandemic vulnerability should be understood as a dynamic characteristic rather than an essential attribute of a particular individual or a group.

- *Situational factors* of vulnerability include context-specific complications to risk and crisis communication – such as the degree of exposure to various false and/or harmful information – that could hamper people's understanding of hazards they may face and appropriate courses of action they should take, or harm them in other ways. These have been at the

centre of our current study. As we have shown, people may be exposed to messages that, on the one hand, discourage the adoption of appropriate risk behaviour that is recommended by health authorities, and on the other hand, encourage the use of false or potentially harmful remedies (Types 1 and 2). Information disorder may also affect the ways in which people interpret health risks – how likely they are to catch a virus and how seriously it may affect them – thereby possibly encouraging them to behave in ways that could pose a hazard both to themselves as well as to those who come in contact with them (Types 3 and 4). Moreover, people may fall victim of pandemic-related scams or harassment (Types 5 and 6). People are more likely to become vulnerable if the situational factors are novel and they have no previous experiences with coping in such circumstances.

- *Individual factors* of vulnerability include person-specific limitations to cognitive capacity and/or lack of particular skills (e.g., media literacy/information literacy) that could make it more difficult for an individual to recognise false information or scams, and limited social power (e.g., being a member of a minority/historically suppressed group in society) that could mean a person could be more likely to be subjected to harassment/hate speech in the context of a health crisis.
- *Social-structural factors* arise from various historically, politically and culturally constructed forms of social inequality, and configurations of government policies that exacerbate or fail to mitigate these. In the context of a pandemic, authorities may fail to provide accurate risk information and behavioural guidance quickly enough and in a manner that is tailored to the needs of various groups in society (Clark-Ginsberg and Petrun Sayers, 2020), thereby providing fertile ground for rumour-mongering and the diffusion of harmful speculations. Susceptibility to false information is higher in societies with increasing political polarisation, low trust in news sources, and weak public service media (Humprecht, Esser, and Van Aelst, 2020). And the risk of falling victim to scams or hate speech is higher in societies with no effective policy measures in place to combat (cyber)crime and xenophobia. Accordingly, social-structural factors could be seen as most consequential: when policies and other social-structural measures are introduced that support people's information literacy and broad understanding of pandemic-related risks, and when improved social conditions help to increase everyone's capacity and willingness to react appropriately to health crises, then situational and individual factors become less critical.

Importantly, people may suffer due to being exposed to harmful information irrespective of the actual motivation of the creator or sender of the harmful message – whether it was intended to cause harm to someone or meant as a benevolent piece of advice or a joke. Harmful information may sometimes be part of (political) disinformation attacks perpetrated by state actors. Some people may try to capitalise on the fear and confusion created by the pandemic and spread harmful information either to sell some goods or services, or as part of criminal activity (cybercrime, scams). In the context of a (health) crisis, political officeholders may be concerned with avoiding personal blame for any adverse outcomes and therefore focus on attempts of shifting or diffusing blame by making false or distorted claims (see, e.g., Hansson, 2018a, 2018b). People may also give advice to others that is well-intended but may inadvertently cause harm, for instance, if the advice concerning some remedy is not based on medical science. Moreover, in some cases, outdated information may become harmful when spread via social media (e.g., the Lithuanian mask advice).

Governments and health organisations are understandably concerned about the rise of pandemic-related misinformation and are trying to come up with various policy responses (UN, 2020; European Commission, n/d; WHO, 2020). There is a growing body of scholarly literature on the spread of health misinformation (Krishna and Thompson, 2019; Wang et al., 2019). Researchers are looking for ways to improve pandemic-related science communication (Van Bavel et al., 2020), 'inoculate' people against false information (Roozenbeek and Van Der Linden,

2019) and encourage them to refute false or misleading health information on social media (Bode and Vraga, 2018). However, our study suggests that to spot and mitigate possible information-related vulnerabilities emerging during health crises, it is important to look beyond mis- and disinformation – because harmful information may not always be false. For instance, people may not see the doctor or go to hospital for relatively urgent reasons because, based on factually accurate messages sent out by hospitals, they are afraid of contracting the coronavirus or think there is not enough capacity to deal with other diseases than COVID-19.

Moreover, our study highlights that not all of the harmful information that could make people more vulnerable in the context of a health crisis is health-related. Some types of harmful information seem to be specific to the particular pandemic and their content deals with medical issues (e.g., discouraging protective actions and promoting false remedies), while others – such as scams and incitement to hatred – rely more generally on the uncertainty created by a new crisis to take advantage of people's fears. Hence, it would be insufficient to focus on responding to medical misinformation only.

Our study also suggests that to understand information-related pandemic vulnerability, it is important to look beyond content spread via social media, because harmful information behaviour may occur in person, over telephone, and via traditional news media. In several cases in our study, harmful information was originally published in local newspapers, non-mainstream news websites, or some social media profiles, but thereafter shared more widely via social media. Several stories appeared in multiple countries and spread internationally (e.g., regarding vitamin C, blood group 0). However, further large-scale empirical studies covering more countries are needed to explore the patterns of diffusion of particular harmful messages.

5. Concluding remarks

While many authors have drawn attention to the diffusion of false information in the context of pandemics, in this study, we have zoomed in on the harmfulness dimension of the COVID-19 information disorder. We have put forward an empirical typology that helps to think systematically about particular information disorders as situational factors of social vulnerability that could adversely affect people's coping capacity during a pandemic. By carrying out this qualitative exploratory study, we have laid the preliminary conceptual groundwork for future quantitative/comparative studies into prevalence and effects of harmful information during outbreaks.

While there are admittedly no simple solutions for doing away with various information disorders altogether, a more detailed understanding of the types of harmful information that may occur during a pandemic would help risk communicators prepare specific interventions to mitigate people's information-related vulnerability during future health crises.

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